

CLAIMS

We Claim:

5 1. A method for selecting an optimal coupling temperature of a nucleic acid synthesis reaction comprising:

 a) providing:

 i. a nucleic acid synthesizer comprising a heating component;
 and

10 ii. nucleic acid synthesis reagents;

 b) synthesizing a plurality of nucleic acid molecules with said synthesizer and said nucleic acid synthesis reagents, wherein the synthesis of each nucleic acid molecule of said plurality of nucleic acid molecules comprises a coupling reaction performed at a
15 different temperature within a temperature range; and

 c) measuring nucleic acid synthesis efficiency for each of said syntheses of said plurality of nucleic acid molecules; and

 d) selecting an optimal coupling temperature within said temperature range.

20 2. The method of Claim 1, wherein said temperature range is 20 to 60 degrees C.

25 3. A nucleic acid synthesizer comprising one or more reaction chambers and a heating component configured to heat said one or more reaction chambers during a synthesis reaction.

30 4. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a resistance heater.

5. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a Peltier device.

6. The nucleic acid synthesizer of Claim 3, wherein said heating component
5 comprises a heated reagent.

7. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a magnetic induction device.

8. The nucleic acid synthesizer of Claim 3, wherein said heating component
10 comprises microwaves.

9. The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a transfer of heat from a fluid or a gas.

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10. A nucleic acid synthesizer, comprising:

- a. one or more reaction chambers containing an oligonucleotide; and
- b. a heating component,

wherein said heating component is configured to heat said one or more reaction
20 chambers during a synthesis reaction wherein said oligonucleotide is coupled to a
synthesis reagent.

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